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Application No. 11-086552

Begin Translation:

CLAIMS

[Claim(s)]

[Claim 1] The speed-increasing system which accelerates the revolution inputted from the revolution input section, and the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, The stator section which has the coil which constitutes a magnetic circuit through the magnet and gap of this Rota section, The control circuit to which the electrical potential difference outputted from the coil of this stator section is restricted, and torque required for the input of the above-mentioned revolution input section is changed, The generator which comes to have the clutch device in which the above-mentioned revolution input section is made to idle when it is prepared between the above-mentioned revolution input section and the above-mentioned speed-increasing system and the above-mentioned torque exceeds a fixed value.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the configuration for controlling too much input in a manual small generator especially about a generator.

[0002]

[Description of the Prior Art] The manual small generator put in practical use by the current general one is equipped with the speed-increasing system which accelerates the revolution inputted from the revolution input section, the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, and the stator section which has the coil which counters with the magnet of this Rota section and is arranged, and is constituted.

[0003] A speed-increasing system accelerates the revolution which came to combine two or more gears and was inputted from the revolution input section dozens times, and transmits it to the Rota section.

[0004] As for the magnet of the Rota section, N pole and the south pole are magnetized by turns by the hand of cut, on the other hand, plurality is arranged in a magnetic hand of cut, and the coil of the stator section constitutes the magnetic

circuit between magnets.

[0005] And if the high-speed revolution of the magnet is carried out by the speed-increasing system, by the magnetic action between a magnet and a coil, electromotive force will arise in a coil and a generation of electrical energy will be performed.

[0006]

[Problem(s) to be Solved by the Invention] With the conventional generator constituted like the above, when turning the revolution input section with what speed, it did not understand whether it would be suitable, therefore the revolution input section was turned too much at too much rate, the superfluous force joined the device section, and the operator had a possibility of damaging a mechanism element, or a superfluous electrical potential difference having joined the circuit section, and damaging a circuit. It makes as a technical problem that this invention cancels such a trouble.

[0007]

[Means for Solving the Problem] As what solves the above-mentioned technical problem, the generator of this invention The speed-increasing system which accelerates the revolution inputted from the revolution input section, and the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, The stator section which has the coil which constitutes a magnetic circuit through the magnet and gap of this Rota section, If the electrical potential difference outputted from the coil of this stator section is restricted, it is prepared between the control circuit to which torque required for the input of the revolution input section is changed, and the revolution input section and a speed-increasing system and the above-mentioned torque exceeds a fixed value, it will come to have the clutch device in which the revolution input section is made to idle.

[0008] Thus, with the generator of this invention constituted, since a clutch device operates and the revolution input section idles when the revolution input section is turned too much at too much rate, an operator can generate electricity by lowering the rate of the revolution input section and turning at a proper rate.

[0009]

[Embodiment of the Invention] Hereafter, the example of a gestalt of operation of this invention is explained to a detail, referring to a drawing.

[0010] The base plate with which 1 shows the manual small generator by this invention as a whole in drawing 1 and drawing 2 , and 2 becomes that base, and 3 are wrap coverings about this base plate 2. The speed-increasing system which accelerates the revolution inputted from the revolution input section on the base plate 2 in the condition of fitting in the interior of this covering 3, It has the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, the stator section which has the coil which constitutes a magnetic circuit through the magnet and gap of this Rota section, and

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[0011] When a speed-increasing system is explained first, this speed-increasing system has the revolution input gear 4 and the accelerating gear 5, and is constituted. This revolution input gear 4 and the accelerating gear 5 are supported to revolve by the base plate 2 pivotable at the fixed shafts 6 and 7 by which set-up immobilization was carried out, respectively.

[0012] The handle 8 as the revolution input section is attached to the revolution input gear 4 through the clutch device 20. This handle 8 becomes by the fastener 9

attached to the fixed shaft 6 pivotable with the revolution input gear 4, and the lever 10 prolonged in the direction of a periphery from this fastener 9, a knob 11 is formed in the point of this lever 10, and the revolution input gear 4 rotates to this and one by having this knob 11 by hand and turning a handle 8. In addition, in this handle 8, to the fastener 9, 180-degree clinch is possible for a lever 10, and it is made by this by using a shaft 12 as the supporting point with the structure which can contain the part of a knob 11.

[0013] The clutch device 20 constituted between this handle 8 and the revolution input gear 4 is explained in detail later.

[0014] It comes to form minor diameter gear section 5a and major-diameter gear section 5b in one, and minor diameter gear section 5a gears with the revolution input gear 4, on the other hand, major-diameter gear section 5b gears with the gear 14 of the Rota section, and the accelerating gear 5 has the work which the revolution of the revolution input gear 4 is accelerated dozens times, and is transmitted to the Rota section.

[0015] The Rota section resembles the magnet 16 of the shape of a ring fixed to the gear 14 supported to revolve pivotable at the fixed shaft 13 by which set-up immobilization was carried out, this gear 14 and the disc-like revolution yoke 15 which rotates to one, and this revolution yoke 15 by the base plate 2, and is constituted more. In addition, in the generator 1 of this example, up and down, 2 sets counters and the revolution yoke 15 and magnet 16 of this Rota section are formed.

[0016] Two or more pole magnetization of N pole and the south pole is carried out by turns in that hand of cut, the magnet 16 of this Rota section counters in this magnet 16 and the axial direction (the direction of a revolving shaft), and the stator section is arranged.

[0017] This stator section comes to have the above-mentioned magnet 16 and the coil 18 which constitutes a magnetic circuit through the gap of the axial direction on the circuit board 17. If plurality is arranged in the hand of cut of a magnet 16 and the high-speed revolution of the magnet 16 of the Rota section is carried out, by the magnetic action between a magnet 16 and a coil 18, electromotive force will arise in a coil 18 and, as for this coil 18, a generation of electrical energy will be performed.

[0018] Especially in the generator 1 constituted, the clutch device 20 for suppressing too much revolution input is established by this example between the handles 8 and the revolution input gears 4 of a speed-increasing system which are the revolution input section like the above.

[0019] This clutch device 20 comes to have the clutch plate 21 attached to the fixed shaft 6 pivotable between the fastener 9 of a handle 8, and the revolution input gear 4. As this clutch plate 21 rotates to a handle 8 and one and it is shown in that underside side at drawing 3, projection formation of two or more projections 22 is carried out at equal intervals in the hoop direction.

[0020] As shown in the revolution input gear 4 at drawing 4 corresponding to this, the hole 23 of the same number is formed in the hoop direction at equal intervals, and the projection 22 of the above-mentioned clutch plate 21 engages with this hole 23. In addition, as shown in drawing 5 here, the projection 22 of a clutch plate 21 is formed in the hand of cut of a clutch plate 21 at the projection configuration which becomes circular.

[0021] Between the fastener 9 of a handle 8, and the clutch plate 21, the wave washer 24 is inserted as an elastic member, and it deflects in the direction in which

a clutch plate 21 is pushed against down [4], i.e., a revolution input gear, by the elastic force of this wave washer 24, and has the structure where engagement in the projection 22 of a clutch plate 21 and the hole 23 of the revolution input gear 4 is maintained by this.

[0022] Thus, in the usual condition, the projection 22 of a clutch plate 21 and the hole 23 of the revolution input gear 4 are being engaged, if a handle 8 is turned for this reason, the revolution input gear 4 will rotate to this and one, and a generation of electrical energy will be performed to them.

[0023] And when a handle 8 is turned with too much rotational speed, the clutch device 20 operates. According to namely, the force which a clutch plate 21 tends to rotate too much to the revolution input gear 4 to a handle 8 and one The wave washer 24 bends and the projection 22 of a clutch plate 21 separates from the hole 23 of the revolution input gear 4 (it separates from projection 22 from a hole 23 smoothly by being formed in the hand of cut of a clutch plate 21 at the projection configuration which becomes circular, as shown in drawing 5 at this time). For this reason, it operates so that a handle 8 may idle to the revolution input gear 4.

[0024] In this actuation, the clutch device 20 operates with combination with the control circuit constituted on the circuit board in a generator.

[0025] This control circuit is shown in drawing 6 . In this circuit, the electrical potential difference (three-phase-circuit electrical potential difference according to three coils in this case) generated with the coil 18 is rectified by direct current voltage for the diode of the rectification section 30, by DC-DC converter 31, a down convert is carried out and this electrical potential difference is outputted to 5V.

[0026] In this example, the voltage-limiting section 32 is formed between the rectification section 30 and DC-DC converter 31 in this circuit. This voltage-limiting section 32 is zener diode D1. Transistor Q1 It comes to have and a rectification electrical potential difference is zener diode D1. When the set-up electrical potential difference is reached, it is a transistor Q1. When many currents flow, coil resistance increases and the internal voltage drop by coil resistance becomes large, and it operates so that an electrical potential difference may be restricted.

[0027] That is, when it generates electricity by turning a handle 8, it is zener diode D1 about the electrical potential difference on which a rectification electrical potential difference occurs in proportion to the rotational frequency of a handle as shown in drawing 7 , and the voltage-limiting section 32 operates here. When it is set as 14V, it is a transistor Q1 by actuation of the voltage-limiting section 32 in the place where the rectification electrical potential difference became 14V. Many currents flow and an electrical potential difference is restricted.

[0028] Thus, if an electrical potential difference is restricted, the force of the sense in which a coil current bars a revolution of increase and a magnet will become large, and, for this reason, torque required for the revolution input of a handle 8 will become large.

[0029] That is, if the rotational frequency of a handle exceeds 120 which is a proper rotational frequency - 180rpm as shown in drawing 8 , torque rapidly required for the revolution input of a handle 8 will become large, that is, actuation of turning a handle 8 becomes heavy.

[0030] If the operating point of the clutch device 20 is about set as 1.5kgcm(s) here, it will be in the condition that the projection 22 of a clutch plate 21 separates from the hole 23 of the revolution input gear 4 in the place where the above-mentioned torque exceeded 1.5kgcm(s), and a handle 8 idles, and a generation of electrical energy will be suspended.

[0031] And when it comes to such a condition, an operator notices having turned the handle 8 too much at too much rate, can lower the rate which turns a handle 8 and can continue a generation of electrical energy by 120 which is a proper rotational frequency - 180rpm.

[0032] Thus, since whether it is suitable can control too much revolution input intelligibly therefore with the generator 1 of this example if a handle 8 is turned with what speed, there is no possibility of the superfluous force joining the device section and damaging this. Moreover, since the input maximum rating electrical potential difference of DC-DC converter 31 is not exceeded, dependability can go up by the circuit section, and it is not necessary to make the input maximum rating electrical potential difference of DC-DC converter 31 high beyond the need here, and IC cost can be lowered. Furthermore, since generation of heat does not need to become large in the circuit section, a heat sink is unnecessary and it becomes advantageous to a miniaturization.

[0033] As mentioned above, although an example of the gestalt of operation of this invention was explained, it cannot be overemphasized that it is what can otherwise take various operation gestalten, without limiting this invention to the configuration of this example.

[0034]

[Effect of the Invention] If the revolution input section is turned with what speed with the generator of this invention as explained above, it is intelligible whether it is suitable. Therefore, since too much revolution input can be controlled, breakage of the device section or the circuit section can be prevented certainly, and a reliable generator can be offered.

TECHNICAL FIELD

[Field of the Invention] This invention relates to the configuration for controlling too much input in a manual small generator especially about a generator.

PRIOR ART

[Description of the Prior Art] The manual small generator put in practical use by the current general one is equipped with the speed-increasing system which accelerates the revolution inputted from the revolution input section, the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, and the stator section which has the coil which counters with the magnet of this Rota section and is arranged, and is constituted.

[0003] A speed-increasing system accelerates the revolution which came to combine two or more gears and was inputted from the revolution input section dozens times, and transmits it to the Rota section.

[0004] As for the magnet of the Rota section, N pole and the south pole are magnetized by turns by the hand of cut, on the other hand, plurality is arranged in a magnetic hand of cut, and the coil of the stator section constitutes the magnetic circuit between magnets.

[0005] And if the high-speed revolution of the magnet is carried out by the speed-increasing system, by the magnetic action between a magnet and a coil, electromotive force will arise in a coil and a generation of electrical energy will be performed.

EFFECT OF THE INVENTION

[Effect of the Invention] If the revolution input section is turned with what speed with the generator of this invention as explained above, it is intelligible whether it is suitable. Therefore, since too much revolution input can be controlled, breakage of the device section or the circuit section can be prevented certainly, and a reliable generator can be offered.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] With the conventional generator constituted like the above, when turning the revolution input section with what speed, it did not understand whether it would be suitable, therefore the revolution input section was turned too much at too much rate, the superfluous force joined the device section, and the operator had a possibility of damaging a mechanism element, or a superfluous electrical potential difference having joined the circuit section, and damaging a circuit. It makes as a technical problem that this invention cancels such a trouble.

MEANS

[Means for Solving the Problem] As what solves the above-mentioned technical problem, the generator of this invention The speed-increasing system which accelerates the revolution inputted from the revolution input section, and the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, The stator section which has the coil which constitutes a magnetic circuit through the magnet and gap of this Rota section, If the electrical potential difference outputted from the coil of this stator section is restricted, it is prepared between the control circuit to which torque required for the input of the revolution input section is changed, and the revolution input section and a speed-increasing system and the above-mentioned torque exceeds a fixed value, it will come to have the clutch device in which the revolution input section is made to idle.

[0008] Thus, with the generator of this invention constituted, since a clutch device operates and the revolution input section idles when the revolution input section is turned too much at too much rate, an operator can generate electricity by lowering the rate of the revolution input section and turning at a proper rate.

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[Embodiment of the Invention] Hereafter, the example of a gestalt of operation of this invention is explained to a detail, referring to a drawing.

[0010] The base plate with which 1 shows the manual small generator by this invention as a whole in drawing 1 and drawing 2 , and 2 becomes that base, and 3 are wrap coverings about this base plate 2. The speed-increasing system which accelerates the revolution inputted from the revolution input section on the base plate 2 in the condition of fitting in the interior of this covering 3, It has the Rota section which has the magnet in which a high-speed revolution is carried out by this speed-increasing system, the stator section which has the coil which constitutes a magnetic circuit through the magnet and gap of this Rota section, and

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[0012] The handle 8 as the revolution input section is attached to the revolution input gear 4 through the clutch device 20. This handle 8 becomes by the fastener 9 attached to the fixed shaft 6 pivotable with the revolution input gear 4, and the lever 10 prolonged in the direction of a periphery from this fastener 9, a knob 11 is formed in the point of this lever 10, and the revolution input gear 4 rotates to this and one by having this knob 11 by hand and turning a handle 8. In addition, in this handle 8, to the fastener 9, 180-degree clinch is possible for a lever 10, and it is made by this by using a shaft 12 as the supporting point with the structure which can contain the part of a knob 11.

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[0014] It comes to form minor diameter gear section 5a and major-diameter gear section 5b in one, and minor diameter gear section 5a gears with the revolution input gear 4, on the other hand, major-diameter gear section 5b gears with the gear 14 of the Rota section, and the accelerating gear 5 has the work which the revolution of the revolution input gear 4 is accelerated dozens times, and is transmitted to the Rota section.

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[0022] Thus, in the usual condition, the projection 22 of a clutch plate 21 and the hole 23 of the revolution input gear 4 are being engaged, if a handle 8 is turned for this reason, the revolution input gear 4 will rotate to this and one, and a generation of electrical energy will be performed to them.

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[0026] In this example, the voltage-limiting section 32 is formed between the rectification section 30 and DC-DC converter 31 in this circuit. This voltage-limiting section 32 is zener diode D1. Transistor Q1 It comes to have and a rectification electrical potential difference is zener diode D1. When the set-up electrical potential difference is reached, it is a transistor Q1. When many currents flow, coil resistance increases and the internal voltage drop by coil resistance becomes large, and it operates so that an electrical potential difference may be restricted.

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of turning a handle 8 becomes heavy.

[0030] If the operating point of the clutch device 20 is about set as 1.5kgcm(s) here, it will be in the condition that the projection 22 of a clutch plate 21 separates from the hole 23 of the revolution input gear 4 in the place where the above-mentioned torque exceeded 1.5kgcm(s), and a handle 8 idles, and a generation of electrical energy will be suspended.

[0031] And when it comes to such a condition, an operator notices having turned the handle 8 too much at too much rate, can lower the rate which turns a handle 8 and can continue a generation of electrical energy by 120 which is a proper rotational frequency - 180rpm.

[0032] Thus, since whether it is suitable can control too much revolution input intelligibly therefore with the generator 1 of this example if a handle 8 is turned with what speed, there is no possibility of the superfluous force joining the device section and damaging this. Moreover, since the input maximum rating electrical potential difference of DC-DC converter 31 is not exceeded, dependability can go up by the circuit section, and it is not necessary to make the input maximum rating electrical potential difference of DC-DC converter 31 high beyond the need here, and IC cost can be lowered. Furthermore, since generation of heat does not need to become large in the circuit section, a heat sink is unnecessary and it becomes advantageous to a miniaturization.

[0033] As mentioned above, although an example of the gestalt of operation of this invention was explained, it cannot be overemphasized that it is what can otherwise take various operation gestalten, without limiting this invention to the configuration of this example.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the vertical section side elevation of the generator by this invention.

[Drawing 2] It is a **** plan.

[Drawing 3] It is the bottom view of a **** clutch plate.

[Drawing 4] It is the plan of a **** revolution input gear.

[Drawing 5] It is drawing of longitudinal section of the important section of a **** clutch device.

[Drawing 6] It is the circuit diagram showing a **** control circuit.

[Drawing 7] It is property drawing of a **** rectification electrical-potential-difference-rotational frequency.

[Drawing 8] It is property drawing of a **** torque-rotational frequency.

[Description of Notations]

1 [.. A handle (revolution input section), 16 / .. A magnet, 18 / .. A coil, 20 / .. A clutch device, 21 / .. A clutch plate, 22 / .. A projection, 23 / .. A hole, 24 / .. Wave washer] A generator, 4 .. A revolution input gear, 5 .. An accelerating gear, 8